

NASA ACAST Workshop 2004

Multi-mode, Multi-function Digital Avionics (MMDA) Break Out Session

August 24-25, 2004

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Agenda

- Breakout session presentations
- Overview of ACAST MMDA plan
 - Discussion/Feedback
- Breakout session discussions
 - Discussion questions

Problem Statement

- Current avionics are generally:
 - not interoperable across CNS modes and national standards;
 - expensive to upgrade and certify;
 - not easily re-configurable for new functions and/or modes;
 - and not able to provide user-selected integration of C, N, S and management functions.
- The number of waveforms (both new and legacy) is beginning to overwhelm ability to fit aircraft with new capabilities.
- A new, cost-effective methodology to certify avionics is needed (both initial and subsequent for added waveforms).

Objective

Develop an architecture and prototype for multi-function multi-mode digital avionics (MMDA) that demonstrate:

- interoperability with international standards and operational modes;
- low life-cycle cost to equip/modify;
- compliance with existing and next generation air-ground and air-air CNS requirements & functions;
- and compliance with redundancy, certification, security and safety standards.

Approach Overview

Architecture Definition

Dual award for architecture definition, cost analysis and certification strategy.

- Open based architecture (maximize use of standards)
- Integration of CNS functions (multifunction capabilities)
- Software programmability and upgrade ability. Do not want a slice based H/W approach
- An architecture supporting redundancy through software
- Agile RF/IF front end enabling multifunction capabilities with fault tolerant operation

Prototype Development

Down select to single industry partner for prototype development

Demonstration

Laboratory and flight demonstrations for validation

Certification

Produce credible data set supporting certification

Staff DER to monitor and advise project

Work with external standards bodies

Schedule

	FY05				FY06				FY07				FY08			
Task Name	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Architecture Definition	◆						◆									
Prototype Development							◆					◆				
Demonstration and Validation											◆					◆
Certification	◆															◆

Key dates

- Statement of Work released FY05, Q3 – Dual Award
- Down select and start prototype development FY07, Q3
- Flight demos FY09

Approach Feedback Discussion

Considering the current State of Art of avionics, what critical features should be part of the architecture?

- Should NASA specify JTRS/SCA approach?
- Minimum supporting certification data?
- Candidate C,N and S functionality?
- RF front end architecture approach?
- Other Feedback, Suggestions

Discussion Topics

- JTRS Architecture – Is this the right solution for civil aviation applications?
- Consider NASA's R&D plan, what approaches can be employed to resolve certification issues?
- Should the goal be the development of an open standard architecture?